US009198647B2

(12) **United States Patent**
Kleyman

(10) **Patent No.: US 9,198,647 B2**
(45) **Date of Patent: Dec. 1, 2015**

(54) **FLEXIBLE ACCESS ASSEMBLY**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 73 days.

(21) Appl. No.: **14/164,305**

(22) Filed: **Jan. 27, 2014**

(65) **Prior Publication Data**

US 2014/0243601 A1 Aug. 28, 2014

Related U.S. Application Data

(60) Provisional application No. 61/768,568, filed on Feb. 25, 2013.

(51) **Int. Cl.**

A61B 1/32	(2006.01)
A61B 17/02	(2006.01)
A61B 17/34	(2006.01)
A61B 17/00	(2006.01)

(52) **U.S. Cl.**

CPC ***A61B 17/0218*** (2013.01); ***A61B 17/3417*** (2013.01); ***A61B 17/3421*** (2013.01); *A61B 17/3423* (2013.01); *A61B 2017/00738* (2013.01); *A61B 2017/3466* (2013.01)

(58) **Field of Classification Search**

CPC A61B 17/0218; A61B 17/3417; A61B 17/3421; A61B 17/3423; A61B 2017/00738; A61B 2017/3466

USPC 600/204; 604/104, 264, 164.01, 164.06, 604/164.11, 164.12, 170.02, 170.03

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,682,978	A	7/1987	Martin	
4,756,708	A *	7/1988	Martin	604/170.03
4,863,430	A	9/1989	Klyce et al.	
5,749,859	A	5/1998	Powell	
6,689,152	B2	2/2004	Balceta et al.	
6,761,718	B2	7/2004	Madsen	

(Continued)

FOREIGN PATENT DOCUMENTS

WO	2004/016184	A1	2/2004
WO	2006/100658	A2	9/2006

OTHER PUBLICATIONS

European Search Report from corresponding EP 14156341.1 dated Apr. 15, 2014.

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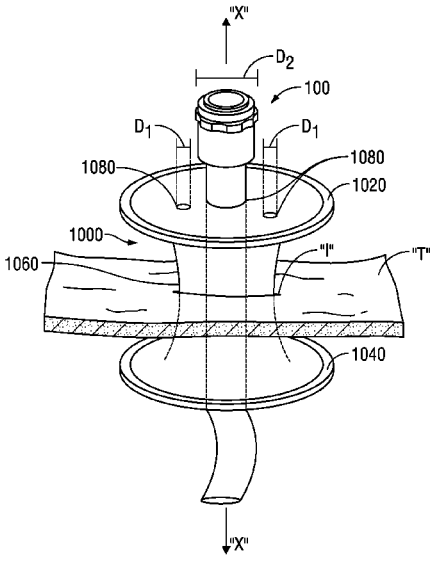
(57) **ABSTRACT**

A cannula assembly includes a cannula and an obturator. The cannula includes an elongated shaft dimensioned to access tissue. The elongated shaft has a lumen extending therethrough. The elongated shaft includes a first shaft segment having a first pre-determined configuration and a second shaft segment having a second pre-determined configuration different from the first pre-determined configuration. The obturator includes an elongated body adapted for insertion through the lumen of the elongated shaft. The elongated body includes a first body segment having a configuration in general accordance with the first pre-determined configuration of the first shaft segment and a second body segment selectively adaptable to conform to the second pre-determined configuration of the second shaft segment upon insertion through the lumen of the elongated shaft.

17 Claims, 6 Drawing Sheets



(56) **References Cited**

U.S. PATENT DOCUMENTS

7,344,554	B2	3/2008	Kuyava et al.	
2002/0058910	A1	5/2002	Hermann et al.	
2002/0173689	A1*	11/2002	Kaplan	600/7
2003/0130668	A1	7/2003	Nieman et al.	
2004/0162559	A1*	8/2004	Arramon et al.	606/62
2004/0210245	A1	10/2004	Erickson et al.	
2005/0107816	A1	5/2005	Pingleton et al.	
2006/0015006	A1	1/2006	Laurence et al.	
2006/0063965	A1	3/2006	Aboul-Hosn et al.	
2007/0078478	A1	4/2007	Atkins et al.	
2007/0203474	A1	8/2007	Ryan et al.	
2009/0082731	A1	3/2009	Moreno	
2009/0093752	A1*	4/2009	Richard et al.	604/24
2009/0187079	A1	7/2009	Albrecht et al.	
2009/0318870	A1	12/2009	Patterson et al.	
2010/0280368	A1	11/2010	Can et al.	

* cited by examiner

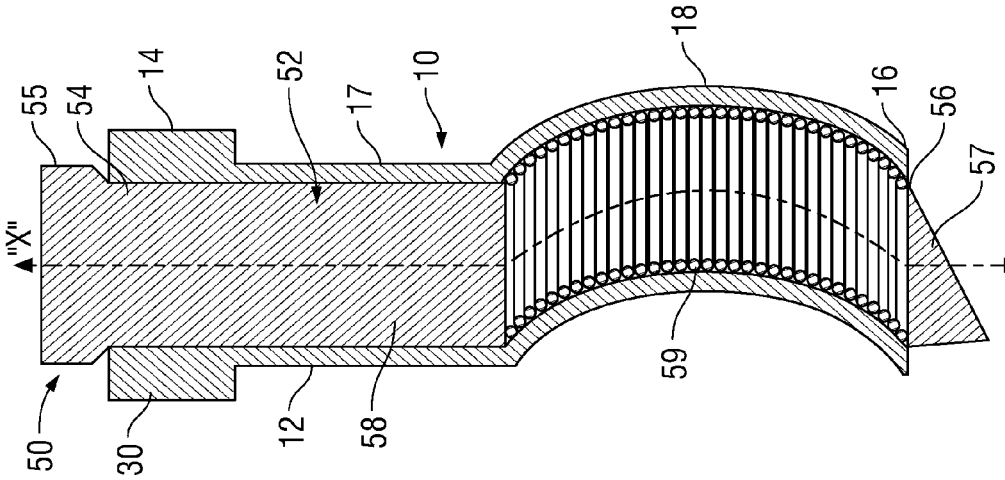


FIG. 3

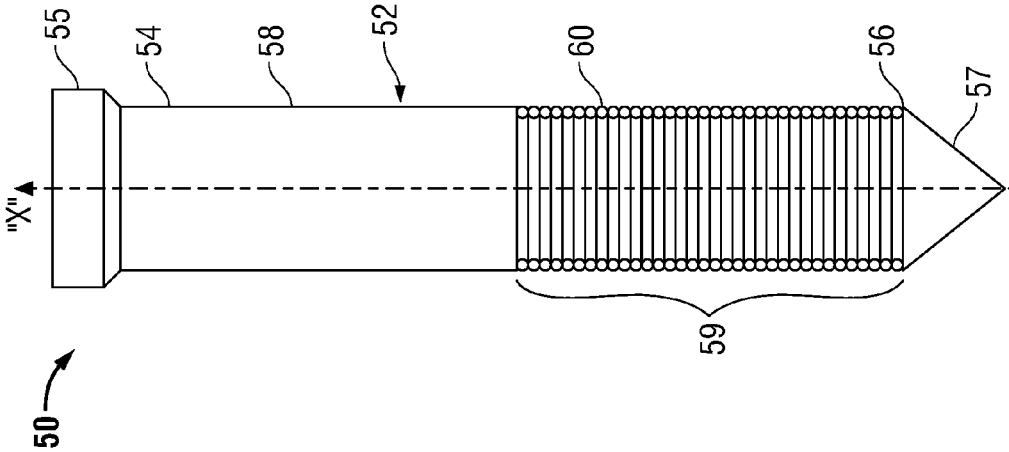


FIG. 2

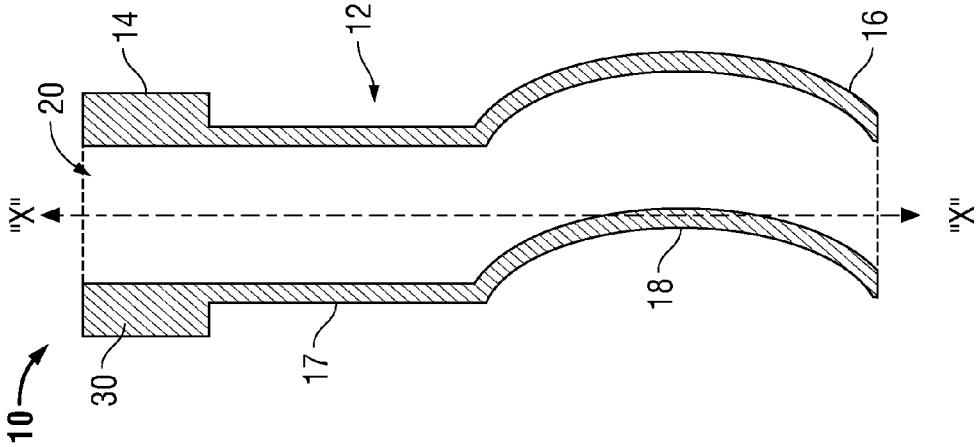


FIG. 1

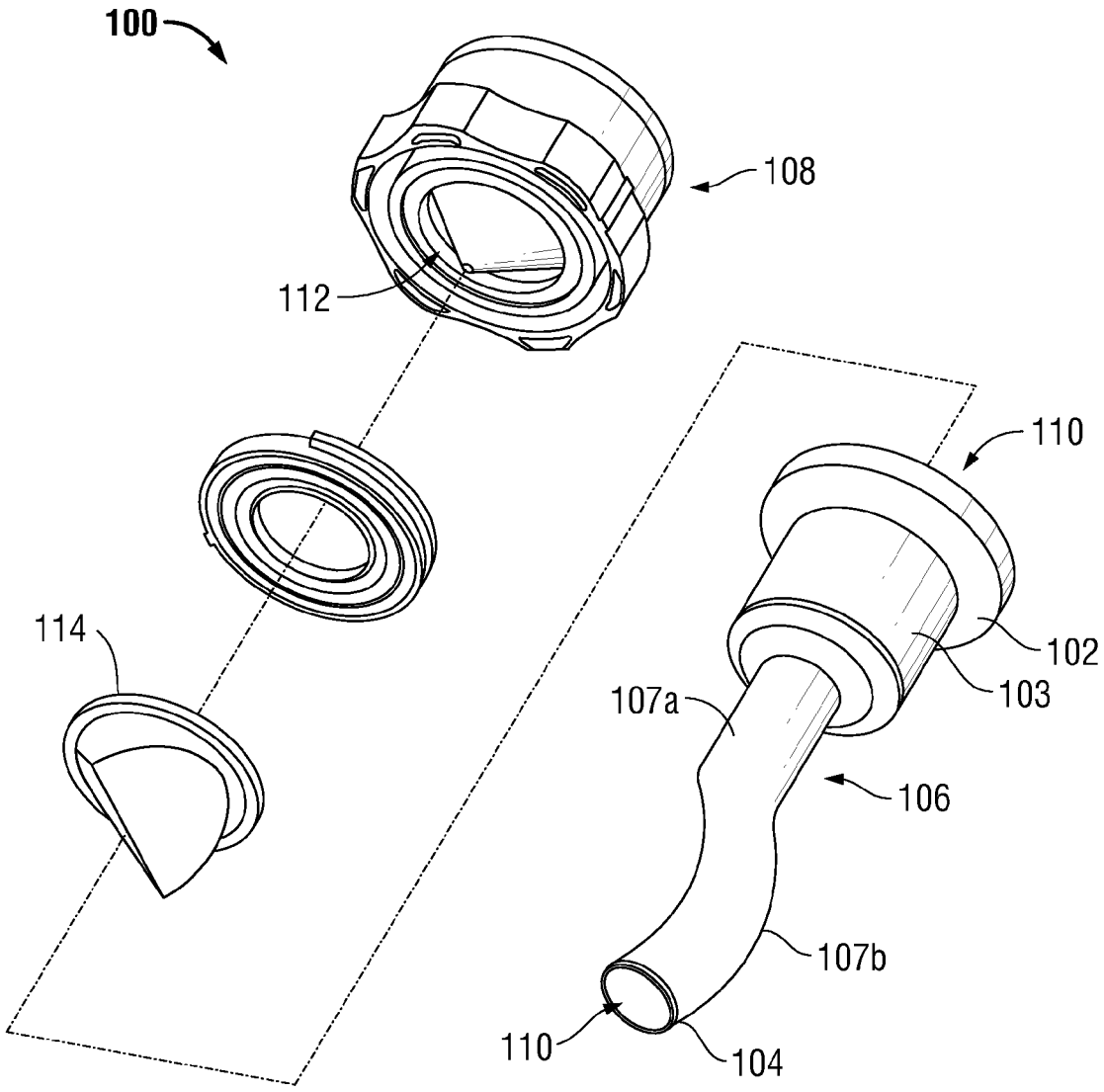


FIG. 4A

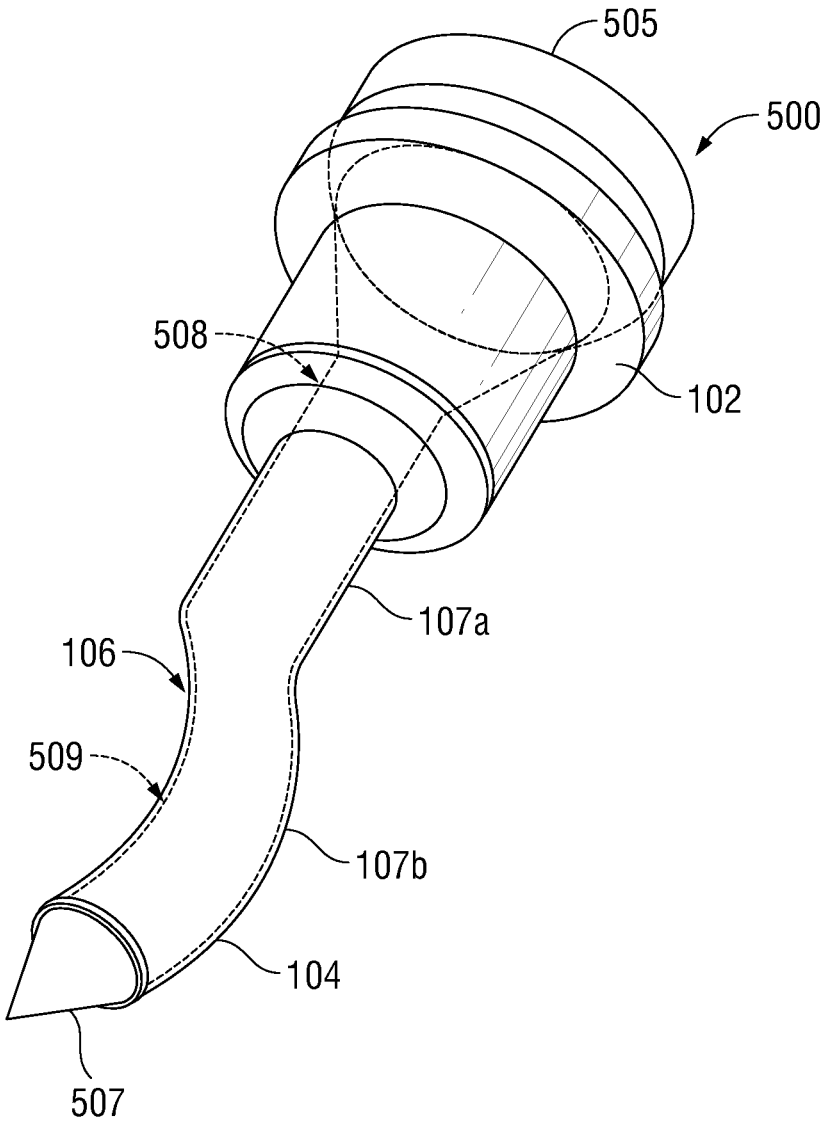


FIG. 4B

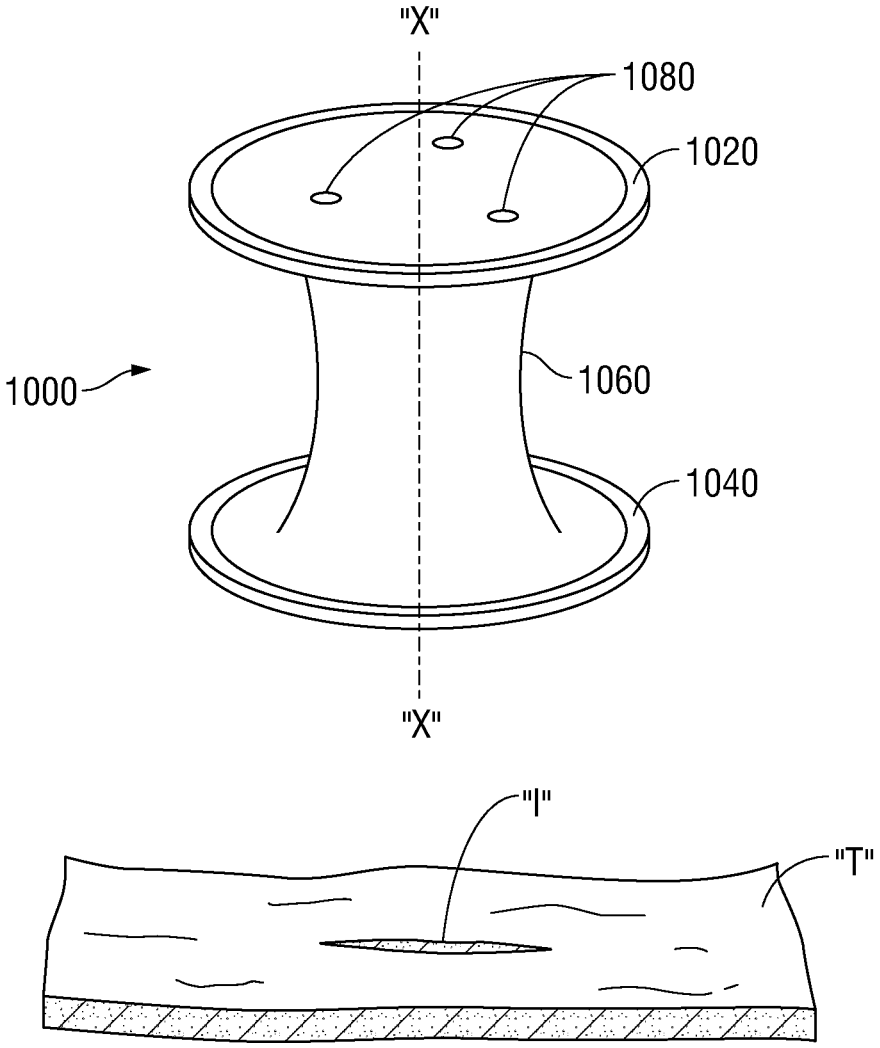


FIG. 5

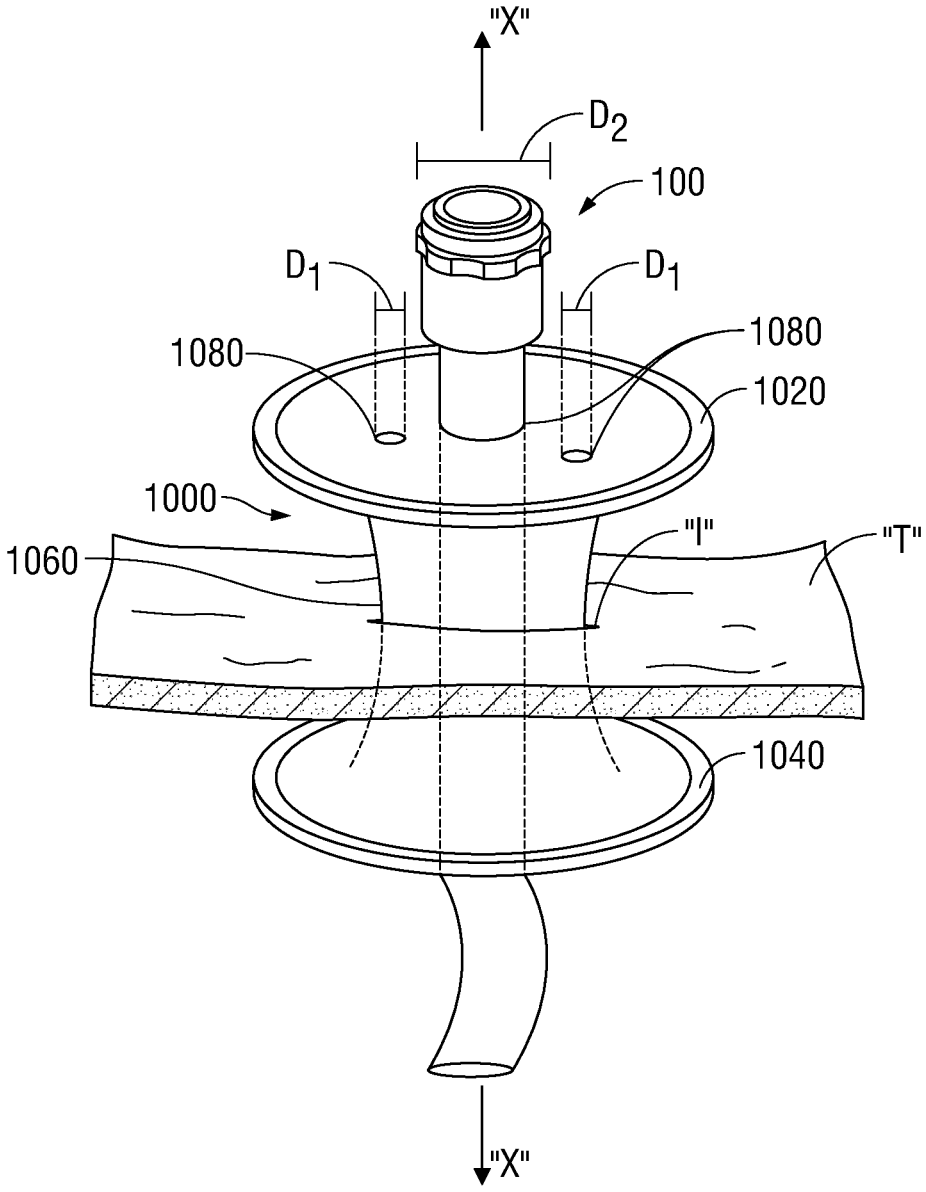


FIG. 6

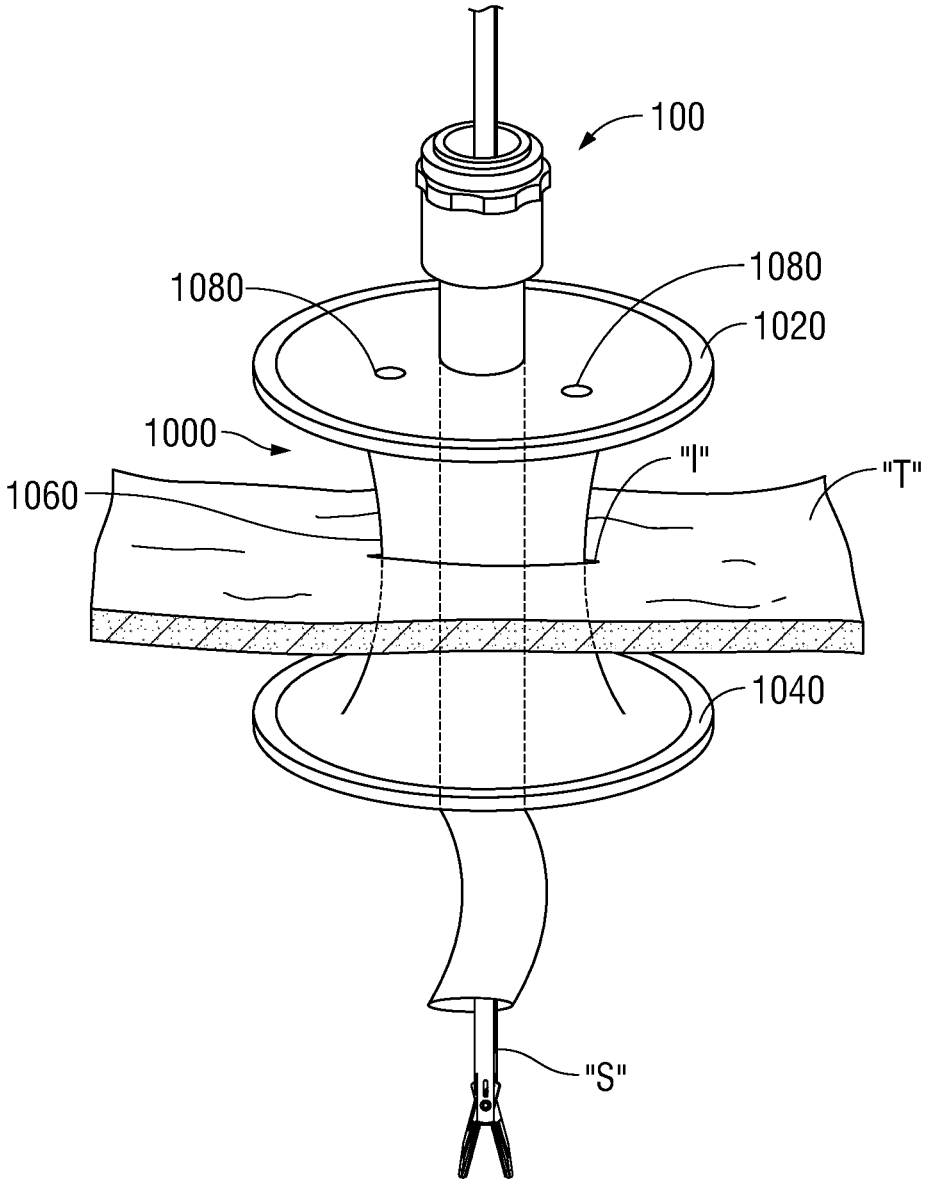


FIG. 7

FLEXIBLE ACCESS ASSEMBLY

CROSS-REFERENCE TO RELATED APPLICATIONS

This application claims the benefit of and priority to U.S. Provisional Patent Application No. 61/768,568, filed Feb. 25, 2013, the entire disclosure of which is incorporated by reference herein.

BACKGROUND

1. Technical Field

The present disclosure relates to surgical instruments and, more particularly, to access assemblies for providing access to internal body cavities, tissues and organs.

2. Background of Related Art

Laparoscopic surgical procedures are minimally invasive procedures in which operations are carried out within the body by means of elongated instruments inserted through small incisions in the body. Laparoscopic procedures are desirable in that they improve patient recovery time and minimize hospital stays as compared to open surgical procedures. Laparoscopic procedures also leave minimal scarring (both internally and externally) and reduce patient discomfort during the recovery period.

During a typical laparoscopic, or minimally invasive procedure, surgical objects, such as surgical access devices, e.g., trocar and cannula assemblies, or endoscopes, are inserted into the patient's body through the incision in tissue. In general, prior to the introduction of the surgical object into the patient's body, insufflation gasses are used to enlarge the area surrounding the target surgical site to create a larger, more accessible work area. Accordingly, the maintenance of a substantially fluid-tight seal is desirable so as to prevent the escape of the insufflation gases and the deflation or collapse of the enlarged surgical site.

Due to the relatively small interior dimensions of the cannulas and/or access ports used in laparoscopic procedures, only elongated, small diametered instrumentation may be used to access the internal body cavities and organs. The manipulation of such instruments within the internal body is similarly limited by both spatial constraints and the need to maintain the body cavity in an insufflated state.

SUMMARY

In accordance with the present disclosure, a cannula assembly is provided. The cannula assembly includes a cannula and an obturator. The cannula includes an elongated shaft dimensioned to access tissue. The elongated shaft has a lumen extending therethrough, defines a longitudinal axis and has proximal and distal ends. The elongated shaft further includes a first shaft segment having a first pre-determined configuration and a second shaft segment having a second pre-determined configuration that is different from the first pre-determined configuration. The obturator includes an elongated body adapted for insertion through the lumen of the elongated shaft. The elongated body has proximal and distal ends. The elongated body further includes a first body segment having a configuration in general accordance with the first pre-determined configuration of the first shaft segment and a second body segment selectively adaptable to conform to the second pre-determined configuration of the second shaft segment upon insertion through the lumen of the elongated shaft.

In one embodiment, the first pre-determined configuration of the first shaft segment defines a general linear segment and the first body segment of the elongated body defines a generally corresponding linear segment.

In another embodiment, the second pre-determined configuration of the second shaft segment defines a general arcuate segment. Upon insertion of the elongated body through the lumen of the elongated shaft, the second body portion of the elongated body is positioned in the second pre-determined configuration having a generally corresponding arcuate segment.

In yet another embodiment, the second shaft segment of the elongated shaft is disposed adjacent the distal end of the elongated shaft. Alternatively, the second shaft segment of the elongated shaft may be disposed intermediate the proximal and distal ends of the elongated shaft.

In still another embodiment, the distal end of the elongated body defines a conical-shaped configuration to facilitate advancement through tissue.

In still yet another embodiment, the elongated body of the obturator defines a longitudinal axis. The second body segment of the elongated body is initially positioned in general alignment with the longitudinal axis. However, upon insertion of the elongated body through the lumen of the elongated shaft, the second body segment is positioned in general oblique relation with the longitudinal axis in general accordance with the second pre-determined configuration of the second shaft segment.

A surgical access system is also provided in accordance with the present disclosure. The surgical access system includes an anchor member and a cannula assembly. The anchor member is positionable within a passage in tissue. The anchor member includes a compressible material and defines a proximal end, a distal end and an intermediate portion. The anchor member is adapted to transition between an at least partially compressed condition to facilitate introduction within the passage in tissue and an at least partially expanded condition to substantially anchor the anchor member relative to the tissue. The anchor member further includes one or more ports extending therethrough. The cannula assembly includes a cannula defining a longitudinal axis and a lumen extending therethrough. The cannula includes a cannula segment offset with respect to the longitudinal axis.

The access system may include an obturator having an elongated obturator body adapted for insertion through the lumen of the cannula. The obturator body has a flexible body segment adapted to follow the path defined by the offset cannula segment. The elongated body has an end dimensioned to extend beyond the cannula and configured to facilitate advancement of the obturator and cannula through the one or more ports of the anchor member with the internal surfaces defining the at least one port of the anchor member establishing a substantial seal about the cannula.

In embodiments, the cannula assembly may be configured according to any of the embodiments of the cannula assembly discussed above.

In another embodiment, a surgical instrument having a flexible shaft segment and an end effector adapted to perform a surgical task is dimensioned for advancement through the lumen of the cannula in the absence of the obturator whereby the flexible shaft segment follows the path defined by the offset cannula segment.

BRIEF DESCRIPTION OF THE DRAWINGS

Various embodiments of the subject instrument are described herein with reference to the drawings wherein:

FIG. **1** is a side, cross-sectional view of one embodiment of a pre-bent access instrument in accordance with the present disclosure;

FIG. **2** is a side plan view of a partially-bendable obturator for use with the pre-bent access instrument of FIG. **1**;

FIG. **3** is a side, cross-sectional view showing the obturator of FIG. **2** inserted through the pre-bent access instrument of FIG. **1**;

FIG. **4**A is an exploded, perspective view of another embodiment of a pre-bent access instrument in accordance with the present disclosure;

FIG. **4**B is a perspective view of the pre-bent access instrument of FIG. **4**A illustrating an obturator inserted therethrough;

FIG. **5** is a side view of a compressible port anchor in accordance with the present disclosure configured for insertion into an incision in tissue;

FIG. **6** is a side view of the compressible port anchor of FIG. **5** shown inserted through the incision in tissue and having a pre-bent access instrument inserted through a port thereof; and

FIG. **7** is a side view of the compressible port anchor of FIG. **5** shown inserted through the incision in tissue with a pre-bent access instrument inserted through a port thereof and a flexible surgical grasper inserted through the pre-bent access instrument.

DETAILED DESCRIPTION

Embodiments of the presently disclosed surgical instruments will now be described in detail with reference to the drawing figures wherein like reference numerals identify similar or identical structural elements. As shown in the drawings and described throughout the following description, as is traditional when referring to relative positioning on a surgical instrument, the term "proximal" or "trailing" refers to the end of the apparatus which is closer to the user and the term "distal" or "leading" refers to the end of the apparatus which is further away from the user.

Turning now to FIG. **1**, a surgical instrument according to the present disclosure is shown generally indentified by reference numeral **10**. Access instrument **10** includes an elongated shaft **12** having a proximal end **14**, a distal end **16** and defining a lumen, or passageway **20** therethrough. Access instrument **10** may be configured as an access portal, e.g., a trocar or a cannula, for providing access to internal body cavities and organs. More specifically, surgical instruments, fluids and/or medicaments may be inserted through lumen **20** of access instrument **10** for use at an internal surgical site. Further, a seal member **30** may be disposed at proximal end **14** of shaft **12** for sealingly engaging an instrument (or instruments), e.g., an obturator **50** (see FIG. **2**), inserted through lumen **20**.

Elongated shaft **12** of access instrument **10** includes a linear portion **17** and an arcuate, or curved portion **18**. Linear portion **17** is disposed about longitudinal axis "X," while curved portion **18** bends, curves off, or is obliquely arranged with respect to longitudinal axis "X." Although a specific configuration of curved portion **18** is shown in FIG. **1**, it is envisioned that curved portion **18** may define various curved, angled, or other bent configurations. Elongated shaft **12** may be formed from any suitable rigid, or semi-rigid medical grade material, e.g., stainless steel, or other suitable bio-compatible materials, e.g., polymeric materials. It is also envisioned that elongated shaft **12** may be formed at least partially from a shape memory material which undergoes a shape-transformation when subject to body temperatures, thereby shaping the surgical instrument, e.g., access instrument **10**, to a desired pre-bent, or curved configuration.

An obturator **50** for use with access instrument **10** is shown in FIG. **2**. Obturator **50** includes a shaft **52** having a proximal end **54** and a distal end **56** and is configured for insertion through lumen **20** of access instrument **10**. A hub **55** is disposed at proximal end **54** of shaft **52**, while distal end **56** of shaft **52** includes a pointed distal tip **57**.

Shaft **52** of obturator **50** includes a relatively rigid portion **58** and a less-rigid, or flexible portion **59**. Rigid portion **58** of shaft **52** may be formed from any suitable medical grade material, e.g., stainless steel, or other suitable rigid bio-compatible material, e.g., polymeric materials. As shown in FIG. **2**, flexible portion **59** of shaft **52** may be formed from a spring coil **60** or, alternatively, flexible portion **59** of shaft **52** may be formed from bio-compatible flexible tubing (not shown) or any other suitable resiliently flexible material. Further, flexible portion **59** may define a length that is equal to, or greater than a length of curved portion **18** of access instrument **10**, such that as, shown in FIG. **3**, obturator **50** is positionable within lumen **20** of access instrument **10** to conform to the configuration, or shape of access instrument **10**.

With continued reference to FIG. **2**, rigid portion **58** of shaft **52** is coaxially disposed about longitudinal axis "X," and provides structural support to shaft **52**, while flexible portion **59** is capable of being bent or angulated relative to the longitudinal axis "X" of shaft **52** in any radial direction to conform obturator **50** to a desired configuration, e.g., the pre-bent configuration of shaft **12** of cannula or access instrument **10**. However, although flexible portion **59** is radially deflectable, it is envisioned that flexible portion **59** of shaft **52** may be substantially rigid, in the axial direction.

FIG. **3** illustrates obturator **50** inserted through and positioned within lumen **20** of access instrument **10**. As shown, pointed distal tip **57** of obturator **50** extends distally from distal end **16** of access instrument **10**, while hub **55** of obturator **50** extends proximally from proximal end **14** of access instrument **10**. More particularly, pointed distal tip **57** allows for penetration, or dissection through tissue. Flexible portion **59** of obturator **50** is deflected off axis or angulated relative to longitudinal axis "X" to conform to the curved configuration of curved portion **18** of shaft **12** of access instrument **10**. However, due to the axial stiffness, or rigidity of flexible portion **59** of shaft **52**, the shaft **52** is not compressed upon distal advancement of access instrument and obturator **10** and **50**, respectively, through tissue. Accordingly, with obturator **50** positioned within access instrument **10**, the access assembly may be advanced distally, lead by pointed distal tip **57** of obturator **50**, through tissue to an internal surgical site. Obturator **50** may then be removed from access instrument **10** such that lumen **20** provides an access port, or cannula, for performing a minimally-invasive surgical procedure at the internal surgical site.

Turning now to FIG. **4**A, in one embodiment, trocar, or access instrument **100** includes respective proximal and distal ends **102**, **104**, a shaft or elongate member **106** disposed therebetween and seal housing **108**. Access instrument **100** is similar to access instrument **10** discussed above.

Elongate member **106** of access instrument **100** includes a straight, or linear portion **107***a* and a curved, or bent portion **107***b* extending along at least a portion of the length thereof. Elongate member **106** further defines an opening **110** extending longitudinally therethrough that is dimensioned to permit

the passage of surgical instrumentation therethrough, such as obturator **500** (FIG. **4**B). As in the previous embodiment, obturator **500** includes a flexible portion **509** (FIG. **4**B) configured to conform to curved portion **107***b* of access instrument **100** when inserted therethrough and a rigid portion **508** to provide structural support to obturator **500**. Obturator **500** is similar to obturator **50** (FIG. **2**).

Access instrument **100** includes seal housing **108** which is associated with or mounted to housing **103** of the access instrument **100**. Seal housing **108** includes an instrument seal **112** that is adapted to receive surgical instrumentation inserted into longitudinal opening **110** so as to form a substantially fluid-tight seal therewith. Access instrument **100** may further includes a closure valve **114** within seal housing **108** or cannula housing **103** that is biased toward a closed position, but is adapted to open upon the introduction of the surgical instrumentation inserted into longitudinal opening **110** to allow the surgical instrumentation to pass therethrough. In the closed position, i.e., in the absence of surgical instrumentation, closure valve **114** creates a fluid-tight seal to, for example, inhibit insufflation gas for escaping through longitudinal opening **110** of access instrument **100**.

Turning now to FIG. **4**B, access instrument **100** is shown with obturator **500** inserted therethrough. More specifically, pointed distal tip **507** of obturator **500** extends distally from distal end **104** of access instrument **100**, while hub **505** of obturator **500** extends proximally from proximal end **102** of access instrument **100**. Further, flexible portion **507** of obturator **500** is bent, or conformed to pre-bent curved portion **107***b* of access instrument **100**. From this position shown in FIG. **4**B, the access assembly may be inserted through tissue or, as will be described below, may be inserted through an access portal, e.g., access portal **1000** (FIG. **5**).

With reference now to FIGS. **5-6**, a seal anchor member **1000** for use during a minimally-invasive surgical procedure is shown. Seal anchor member **1000** defines a longitudinal axis "X" and has a proximal end **1020**, a distal end **1040**, and an intermediate portion **1060** that is disposed between the proximal and distal ends **1020**, **1040**, respectively. Seal anchor member **1000** further includes one or more ports **1080** that extend longitudinally therethrough between proximal and distal ends **1020**, **1040**, respectively, thereof.

Seal anchor member **1000** may be formed from a suitable foam material, e.g., a polyisoprene foam, having sufficient compliance to form a seal about one or more surgical instruments, e.g., access instrument **100**, inserted through one of ports **1080** and also to establish a sealing relation with surrounding tissue. It is envisioned that seal anchor member **1000** be sufficiently compliant to accommodate off axis motion of surgical instrumentation, e.g., access instrument **100**, inserted therethrough. Seal anchor **1000** may be the port anchor disclosed in commonly assigned U.S. patent application Ser. No. 12/244,024, filed Oct. 2, 2008, the entire contents of such disclosure being incorporated herein.

As shown in FIGS. **5-6**, proximal and distal ends **1020**, **1040** of seal anchor member **1000** define substantially planar surfaces, although it is envisioned that either or both of proximal and distal ends **1020**, **1040**, respectively, of seal anchor member **1000** may define surfaces that are substantially arcuate to assist in the insertion of seal anchor member **1000** through an incision "I" in tissue "T."

Intermediate portion **1060** of seal anchor member **1000** extends longitudinally between proximal and distal ends **1020**, **1040**, respectively, of seal anchor member **1000**. Intermediate portion **1006** varies in diameter along a length thereof. Accordingly, seal anchor member **1000** defines a cross-sectional dimension that varies along a length thereof to facilitate the anchoring of seal anchor member **1000** within an incision in tissue. In one embodiment, seal anchor member **1000** defines an "hour-glass" shape or configuration to assist in anchoring seal anchor member **1000** within an incision in tissue. In cross-section, intermediate portion **1060** may exhibit any suitable configuration, e.g., substantially circular, oval or oblong.

Each port **108** extending through anchor seal member **1000** is configured to removably receive a surgical instrument (e.g., access instrument **10**) therethrough. Prior to the insertion of surgical instrumentation, each of ports **1080** is disposed in a first state wherein each of ports **1080** defines a first or initial dimension D_1 (FIG. **6**). Initial dimension D_1 (FIG. **6**) may be about 0 mm such that the escape of insufflation gas (not shown) through ports **1080** of seal anchor member **1000** in the absence of a surgical instrument inserted therethrough is substantially inhibited. For example, each port **1080** may be configured as a slit extending longitudinal through seal anchor member **1000**. Upon the introduction of surgical instrumentation through one (or more) of ports **1080**, port **1080** transitions to a second state in which port **1080** defines a second, larger dimension D_2 (FIG. **6**) that substantially approximates the diameter of the surgical instrument disposed therethrough such that a substantially fluid-tight seal is formed therearound and such that the escape of insufflation gas (not shown) through port **1080** of seal anchor member **1000** is substantially inhibited.

The use and function of access instrument **100** in conjunction with seal anchor member **1000** will be discussed during the course of a typical minimally invasive procedure with reference to FIGS. **4**A-**7**. However, it is envisioned that the cannula assembly, i.e., access instrument **100** and obturator **500**, may be configured for use independently of seal anchor member **1000** and/or in conjunction with any other suitable seal member (not shown).

Initially, the peritoneal cavity (not shown) is insufflated with a suitable biocompatible gas, e.g., CO_2 gas, such that the cavity wall is raised and lifted away from the internal organs and tissue housed therein, providing greater access thereto. The insufflation may be performed with an insufflation needle or similar device, as is conventional in the art. Either prior or subsequent to insufflation, an incision "I" is created in tissue "T", the dimensions of which may be varied dependent upon the nature of the procedure.

Prior to the insertion of seal anchor member **1000** within the incision in tissue, seal anchor member **1000** is in its expanded condition in which the dimensions thereof inhibit the insertion of seal anchor member **1000** into the incision "I" in tissue "T." To facilitate insertion, the clinician transitions seal anchor member **1000** into the compressed condition by applying a force thereto, e.g., by squeezing seal anchor member **1000**. This applied force acts to reduce the radial dimensions of the proximal and distal ends **1020**, **1040**, respectively, of anchor seal member **1000** and similarly reduces the radial dimension of intermediate portion **1060** such that seal anchor member **1000** may be inserted into the incision "I" in tissue "T." Subsequent to insertion, distal end **1040** of seal anchor member **1000** is positioned beneath tissue "T" at which time seal anchor member **1000** may be allowed to transition from the compressed condition back to the expanded condition by removing the force thereon.

During the transition from the compressed condition to the expanded condition, the dimensions of seal anchor member **1000** are increased such that intermediate portion **1060** creates an internal biasing force that is directed outwardly and exerted upon surrounding tissue, thereby creating a substantially fluid-tight seal between the seal anchor member **1000**

and surrounding tissue, while proximal and distal ends **1020**, **1040**, respectively, extend radially from the incision "I" in tissue "T" on the respective external and internal surfaces thereof. Thus, once in position, seal anchor member seals, or inhibits the escape of insufflation gas from the internal surgical site.

Once seal anchor member **1000** is positioned within the incision "I" in tissue "T," as described above, one or more surgical instruments may be inserted through ports **1080**. Surgical instrumentation introduced through one of ports **1080** may be any suitable surgical instrument and, accordingly, may vary in size. Suitable surgical instruments may include graspers, forceps, clip-appliers, staplers, etc. Other access instruments such as, for example, access instrument **100**, may also be introduced through seal anchor member **1000** such that additional surgical instrumentation may be inserted through access instrument **100** (once obturator **500** has been removed from lumen **110** of access instrument **100**) and advanced to the surgical site.

More specifically, with obturator **500** inserted trough access instrument **100**, as shown in FIG. **4**B, the access assembly may be inserted, lead by pointed distal tip **507** of obturator **500**, through one of ports **1080**, enlarging port **1080** and thereby transitioning port **1080** into the second state in which port **1080** defines a second dimension D_2 that substantially approximates the diameter of access instrument **100**, creating a substantially fluid tight seal about access instrument **100** and inhibiting the escape of insufflation gas (not shown) through port **1080** of seal anchor member **1000**, as discussed above. Access instrument **100** may then be advanced into position adjacent the internal surgical site.

With reference now to FIG. **7**, once access instrument **100** is disposed through access portal **1000**, as shown in FIG. **6**, and is positioned as desired for the particular minimally-invasive surgical procedure to be performed at the internal surgical site, obturator **500** may be removed from access instrument **100**. As such, other surgical instrumentation, e.g., surgical grasper "S," may be inserted through opening **110** of access instrument **100** to perform a minimally-invasive surgical procedure at the internal surgical site. One surgical instrument contemplated will have a flexible section adapted to conform or follow the pre-bent or curved configuration of access instrument **10**. Such instruments with flexible shafts are disclosed in commonly assigned U.S. Pat. Nos. 4,473,077 and 7,546,993 and U.S. Patent Publication No. 2009/0090765, the entire contents of each disclosure being incorporated herein. As mentioned above, instrument seal **112** maintains a fluid-tight seal about surgical grasper "S" when inserted through access instrument **100**. Additionally, the pre-bent, or curved configuration of access instrument **100** helps prevent interference, tangling, or "chop-sticking" of surgical instrumentation inserted through the various ports **1080** of seal anchor member **1000**, particularly where multiple surgical instruments are inserted through seal anchor member **1000** and/or where multiple seal ports, e.g., seal anchor members **1000**, are used.

From the foregoing and with reference to the various figure drawings, those skilled in the art will appreciate that certain modifications can also be made to the present disclosure without departing from the scope of the same. While several embodiments of the disclosure have been shown in the drawings, it is not intended that the disclosure be limited thereto, as it is intended that the disclosure be as broad in scope as the art will allow and that the specification be read likewise. Therefore, the above description should not be construed as limiting, but merely as exemplifications of particular embodiments. Those skilled in the art will envision other modifications within the scope and spirit of the claims appended hereto.

What is claimed is:

1. A cannula assembly, comprising:

a cannula including:

a housing having a seal dimensioned to establish a seal about an object introduced therethrough; and

an elongated shaft dimensioned to access tissue, the elongated shaft having a lumen extending therethrough, the elongated shaft defining a longitudinal axis and having proximal and distal ends, the elongated shaft including a first shaft segment having a first pre-determined configuration and a second shaft segment distal of the first shaft segment, the second shaft segment being rigid and having a second pre-determined configuration different from the first pre-determined configuration; and

an obturator including:

an elongated body adapted for insertion through the lumen of the elongated shaft, the elongated body having proximal and distal ends and including a first body segment having a configuration in general accordance with the first pre-determined configuration of the first shaft segment and a flexible second body segment selectively adaptable to conform to the second pre-determined configuration of the second shaft segment upon insertion through the lumen of the elongated shaft.

2. The cannula assembly according to claim **1**, wherein the first pre-determined configuration of the first shaft segment defines a general linear segment and the first body segment of the elongated body defines a general corresponding linear segment.

3. The cannula assembly according to claim **1**, wherein the second pre-determined configuration of the second shaft segment defines a general arcuate segment, whereby, upon insertion of the elongated body through the lumen of the elongated shaft, the second body portion of the elongated body is positioned in the second pre-determined configuration having a general corresponding arcuate segment.

4. The cannula assembly according to claim **1**, wherein the second shaft segment of the elongated shaft is disposed adjacent the distal end of the elongated shaft.

5. The cannula assembly according to claim **1**, wherein the second shaft segment of the elongated shaft is disposed intermediate the proximal and distal ends of the elongated shaft.

6. The cannula assembly according to claim **1**, wherein the distal end of the elongated body defines a conical-shaped configuration to facilitate advancement through tissue.

7. The cannula assembly according to claim **1**, wherein the elongated body defines a longitudinal axis, the second body segment of the elongated body initially positioned in general alignment with the longitudinal axis of the elongated body, whereby, upon insertion of the elongated body through the lumen of the elongated shaft, the second body segment is positioned in general oblique relation with the longitudinal axis in general accordance with the second pre-determined configuration of the second shaft segment.

8. The cannula assembly according to claim **1**, wherein the flexible second body segment of the elongated body is formed from a spring coil.

9. The cannula assembly according to claim **1**, wherein the lumen of the elongated shaft defines a proximal entry opening at the proximal end of the elongated shaft and a distal exit opening at the distal end of the elongated shaft, at least por-

tions of the proximal entry opening and the distal exit opening in longitudinal alignment with each other relative to the longitudinal axis.

10. The cannula assembly according to claim **1**, wherein the first body segment of the elongated body of the obturator is rigid.

11. The surgical access assembly according to claim **1**, wherein the flexible second body segment of the elongated obturator body is formed from a spring coil.

12. A surgical access system, comprising:

an anchor member positionable within a passage in tissue, the anchor member comprising a compressible material and defining a proximal end, a distal end and an intermediate portion, the anchor member adapted to transition between an at least partially compressed condition to facilitate introduction within the passage in tissue and an at least partially expanded condition to substantially anchor the anchor member relative to the tissue, the anchor member including at least one port extending therethrough; and

a cannula assembly including a cannula defining a longitudinal axis and a lumen extending therethrough, the cannula positionable within the at least one port of the anchor member whereby inner surfaces defining the at least one port establish a seal about the cannula, the cannula including a cannula segment offset with respect to the longitudinal axis.

13. The surgical access assembly according to claim **12** including an obturator including an elongated obturator body adapted for insertion through the lumen of the cannula, the obturator body having a flexible body segment adapted to follow the path defined by the offset cannula segment, the elongated body having an end dimensioned to extend beyond the cannula and configured to facilitate advancement of the obturator and cannula through the at least one port of the anchor member.

14. The surgical access assembly according to claim **13**, wherein the offset cannula segment defines a general arcuate segment, whereby, upon insertion of the obturator body through the lumen of the cannula, the flexible body segment of the obturator body is positioned within the offset cannula segment having a general corresponding arcuate segment.

15. The surgical access assembly according to claim **12**, further including a surgical instrument having an elongated shaft with a flexible shaft segment and an end effector adapted to perform a surgical task, the surgical instrument being dimensioned for advancement through the lumen of the cannula in the absence of the obturator whereby the flexible shaft segment follows the path defined by the offset cannula segment.

16. The surgical access assembly according to claim **15**, wherein the cannula includes a seal, the seal dimensioned to establish a seal about the shaft of the surgical instrument.

17. The surgical access assembly according to claim **16**, wherein the lumen of the cannula defines a proximal entry opening at a proximal end of the cannula and a distal exit opening at a distal end of the cannula, at least portions of the proximal entry opening and the distal exit opening in longitudinal alignment with each other relative to the longitudinal axis.

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